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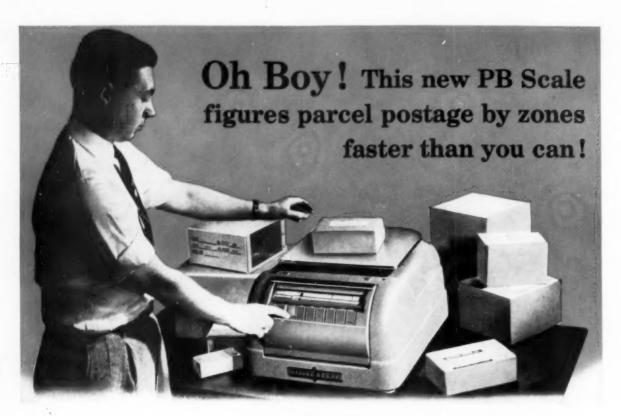
TRANSPORTATION

Vol. 26, No. 4

THE AIR MAGAZINE FOR THE BUSINESS EXECUTIVE

APRIL, 1955







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VOL. 26

APRIL, 1955

No 4

Tigers' Fast Recovery Stressed by Prescott

NEW YORK—Steadily mounting income since the discontinuance of the ill-fated Flying Tiger-Slick merger, and the possibility of a profit for his company's February operations (the first since October, 1954), were highlighted at a press conference here by Robert W. Prescott, president of the Flying Tiger, Line.

dent of the Flying Tiger Line.

Prescott said that "current revenue is in excess of \$1,000,000 a month and marks the highest peacetime economy of the company." He attributed the progress, which he said "should be true for the entire air freight industry," to improved operating and sales procedures. The Flying Tiger head credited the quick recovery to the "establishment in 1954 of the first true scheduling of independent air freight which made it possible to handle air freight on a regular, overnight promise of delivery the next day"; cooperation between employee and management; and the institution of "the first air transportation plan of a sales staff operating on a straight commission and drawing account basis."

With proper planning and operation."

Slick Giving Scheduled Door To Door Service in 20 Cities Soon

NEW YORK—An all-out attempt to "create a new market with deferred service" through contract arrangements with three important regional trucking companies was announced by Delos W. Rentzel, chairman of the board of Slick Airways, at a press conference here. The "marriage of air and surface transportation," Rentzel told the group of business writers, is aimed at providing scheduled door-to-door service in 20 key cities from coast to coast. Utilization of a fully integrated trucking operation will enable off-line shippers and consignees to receive air freight

Prescott declared, "the time is not far off when air freight will become as important to the aviation industry as rail freight is to the railroad industry."

New NAL Phone in N. Y.

NEW YORK—Shippers are advised that the new telephone number of National Airlines' Air Freight Department in this city has been changed to MUrray Hill 7-7180. The address, 80 East 42nd Street, remains the same. service in a considerably wider area.

Rentzel revealed that contractual arrangements have been completed with Associated Transport, which will handle the Eastern part of the United States; Consolidated Freightways, of Portland, Oregon, which will serve the Northwest; and Western Truck Lines, of Los Angeles, which will provide ground service in the Southwest.

Truck Needed

Pointing out that "the airplane cannot exist without the truck." Rentzel said that rates will be brought down to about the rail express level. The new service, which lies between all-air and all-surface, will feature intermediate rates. The Slick chairman likened the "truck-rail-truck" service to the successful piggyback operations of the railroads which is based on the "truck-rail-truck" principle.

Slick's new service, which is to begin

Slick's new service, which is to begin this month, is expected to "bring up the volume of business, which in turn will bring down the rates, which in turn will bring up the volume." Deliveries, Rentzel said, will be made two to three days sooner than REA at "competitive, and, in some cases, lower" rates. Slick will offer unit rates for the coordinated service.

Airborne Produce

The air cargo line will inaugurate an airborne produce system hinged on bringing vine- and tree-ripened fruits and vegetables to markets thousands of miles away. By contract agreement, Slick will purchase "out-of-season items, and in-season items that are in short supply, and sell and deliver them in the markets where they are needed."

Slick, which operates three of the nine DC-6As in this country (the Flying Tigers and American Airlines have three each) would like to get more of these airfreighters. The DC-6A has an operating cost of about 10¢ a ton-mile, in contrast to the 15¢-16¢ a ton-mile of the C-46 also flown by Slick. Rentzel has an interested eye cocked on the Lockheed YC-130 which reportedly operates at 6¢ a ton-mile and is expected eventually to be brought down to 3¢ or 4¢ a ton-mile.

AIRWORK INAUGURAL FLIGHT



Part of the planeload of freight hauled across the ocean on the inaugural all-cargo operation of Airwork Atlantic, Ltd. This close-up at London Airport shows a fork lift truck loading a consignment of delicate equipment into one of Airwork's DC-4 airfreighters. The plane left London on March 1, delivered its cargo to New York on March 2, and returned with assorted Europe-consigned shipments on March 3.

PAGE 4-AIR TRANSPORTATION-Air Commerce

New Quarters in Miami Give Riddle More Room

MIAMI—Riddle Airlines, North-South air freight carrier whose operations since 1947 have mushroomed from a million pounds that year to more than 19,000,000 pounds in 1954, has moved its executive offices to expanded quarters. New location of Riddle is on 36th Street, on the north-west side of Miami International Airport.

Adjoining the airport's animal quarantine station, Riddle's new headquarters include an office and warehouse building as well as a maintenance hangar. The transfer from the carrier's former headquarters on the 20th Street side of the airport was effected under the direction of Guy Tomberlin, vice president-operations.

Rizley Succeeds Ryan As Chairman of CAB

WASHINGTON, D. C .-- Ross Rizley, former Assistant Secretary of Agriculture in the Eisenhower Administration and more recently special legal consultant to the Postmaster General of the United States, has replaced Oswald Ryan as chairman of the Civil Aeronautics Board, Ryan's term of office expired at the end of 1954,

One of Rizley's first moves as chairman was to appoint Robert Lowe Kunzig his assistant.

BOAC Moves to Larger Quarters in Boston

BOSTON-The offices of British Overseas Airways Corporation are now located 76 Arlington Street. According to Eric Wheatley, Boston manager, the new quarters, substantially larger than the previous office at 22 Providence Street, will enable BOAC to consolidate all its departments.

Pakistan Carrier Names Airwork its U. S. Agent

NEW YORK-Airwork Atlantic, Ltd., transatlantic air freight carrier, has been appointed general sales agent in the United States for Pakistan International Airlines. PIA inaugurated its scheduled London-Karachi service February 4.

TCA, Capital Viscounts Beginning U. S. Runs

April 4 is the date Trans-Canada Air Lines has set for the inauguration of its turboprop Viscount service between Monand Toronto and New York. The introduction of the British-manufactured transport will precede Capital Airlines' own opening of Viscount service by three weeks. Capital will start operating its turboprops on the Norfolk-Washington-Chicago run.

Although new to the United States, the Viscount already is a familiar sight in Europe. Commercial airlines in Europe have been flying them for nearly two years.



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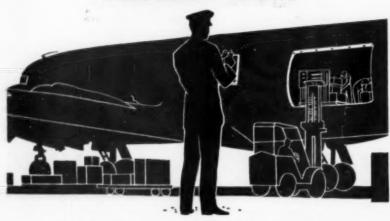
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PAGE 6-AIR TRANSPORTATION-Air Commerce

Routes

Pan Am: Service has been inaugurated between New York and Damascus and Teheran on a three-a-week basis . . . Flights from the West Coast to New Zealand have been stepped up to three a week.

Qantas: "Connoisseur" service has been inaugurated between London and Sydney, Australia. Flights will be once weekly.

TWA: The airline is fighting for CAB approval of a proposed service between Frankfurt and Zurich on its European route.

Mohawk: Service has been opened at White Plains, New York, a stop already served by New York Airways, helicopter airline.

American, Eastern, and Pan Am have filed briefs for nonstop service between New York and Mexico City. Air France is operating this service. Prediction is that it will be a tough fight. Harsh words are being flung around. The United States has no bilateral air agreement with Mexico, and the latter is not very happy about permitting air carriers from the States to start new runs.

Rates

The proposal of seven airlines—two of them all-cargo carriers—to reduce rates from 15% to 40% on certain commodities moving from the West Coast to points east of Minneapolis has been suspended by the Civil Aeronautics Board on the grounds that they may be discriminatory or unfair. Investigation and hearing will follow at a later date.

Carriers making the original proposal were American, Northwest, Capital, TWA, United, Slick, and Flying Tiger. Slick and United are against the rate cuts, and are protesting them, but said they were going along with the proposal for reasons of competition.

George T. Cussen, Flying Tiger's freightvice-president, said in a formal statement that "we do not know what caused this reversal (by Slick and United) of their position, but we want to make it plain that Flying Tiger is determined to presa for these reductions and many shippers already have voluteered their support."

The cuts would kenefit department stores merchandise, aluminum (excluding aircraft and parts) goods, and imports reaching the West Coast via steamer. Typical commodities which would be affected by the proposed reductions include wearing apparel, dry goods, footwear, floor coverings, raw furs, gloves, mittens, handbags, purses, luggage, paper fashion patterns, perfumes, sporting goods, tailor's fittings and trimmings, toys, and umbrellas. Imports of valuables would be barred from lower rates.

Live Cargo

Just for the record, we want to let you know that a Pan Am cargoplane took off from Houston with 22 head of Texas cattle aboard and landed at San Salvador with 23. You guessed it—a calf was born. Lofty midwives were Harold H. Palm and Kenneth G. Hings, both of Pan Am's Miami cargo terminal.

(Continued on Page 8)

₩ AIR TRANSPORTATION

The World's First and Only Air Cargo Magazine . . . Established October, 1942



Member of Business Publications Audit of Circulation, Inc.

AIR TRANSPORTATION, published once each month, thoroughly covers the entire air cargo industry for the benefit of all those engaged in shipping and handling domestic and international air freight, air express, and air parcel post, as well as using the domestic and international air mail services. Included in AIR TRANSPOR-TATION'S wide coverage are: air shipping, cargoplane development, rates, packaging, materials handling, docu-mentation, air cargo terminal development, insurance, routing, interline procedures, new equipment, commercial airlines, military air transport service, air freight forwarders, and business flights.

Subscription rate for United States and Possessions, \$5.00 for one year, \$8.00 for two years, and \$11.00 for three years; foreign countries, \$6.00 for one year, \$10.00 for two years, and \$14.00 for three years. Individual copies, 50 cents each.

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J. B. Tratsart, Ltd. United Kingdom Sales Representative 799, Harrow Road Sudbury, Wembly Middlesex, England

AIR TRANSPORTATION is published by Import Publications, Inc., Ten Bridge Street, New York 4, N. Y.; also publishers of Custom House Guide, American Import & Export Bulletin, and Air Shippers' Manual. Reprinting of any article or portion of an article appearing in this magazine without written permission, is strictly forbidden. AIR TRANSPORTATION is available on microfilm. For information contact publications effice.

10 BRIDGE ST., NEW YORK 4, N. Y. Phone: WHitehall 4-2898

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LIVE CARGO

(Continued from Page 6)

We liked the recent flyer from Sabena's cargo department. Plugging its animal service (including effective drawings of a hog, monkey, elephant, dog, bull, chick, and fish), the flyer provided flight information, as well as pertinent data on Sabena's DC-6C airfreighter.

Air Freight Forwarders

Air Express International Corporation: President Charles L. Gallo points out that new specific commodity rates include substantial savings for importers of furs, cloth, leather products, jewelry and novelties, gloves, and artificial flowers from Paris.

Interline

United Air Lines and Iranian Airways recently inked an interline agreement. There will be mutual acceptance of cargo waybills and passenger tickets.

Airports

Work on Idlewild's widely publicized \$60,000,000 Terminal City has begun. Port of New York Authority plans call for an 11-block-long International Arrival Building with two adjacent Airline Wing Buildings, seven individual Airline Terminal Buildings and roadways, taxiways, aprons, etc., within a 655-acre central landscaped oval. Construction of the International Arrival Buildings and the two Airline Wing Buildings begin this Fall. Completion is scheduled for the early part of 1957.

Last year, Idlewild handled 100,976 plane movements, in contrast to 18,115 in 1949, the first full year of operation. (The airport was opened on July 1, 1948.) During this time cargo handlings rose from 9,159,766 pounds to 87,135,700 pounds; mail, from 2,300,000 pounds to 29,925,000 pounds; and passengers, from 222.620 to 2,939,968.

Estimates for cargo in 1955 are at 118,-240,000 pounds; for 1960, 175,180,000 pounds; and for 1960, 241,000,000 pounds.

Chicago's Midway Airport has become a Customs Port of Entry, according (Continued on Page 16)

Announcement to Readers

In order to make room for the special material in this issue, the regular monthly features, Came 'n' Get It, New Equipment and Business Flight, do not appear at this time. They will be resumed in the May issue.



AT KLOTEN, SWITZERLAND, several Piper Cubs are offloaded from a DC-4 airfreighter with the aid of fork lift trucks.

GETTING THE MOST OUT OF MECHANIZED MATERIALS HANDLING EQUIPMENT



PALLETIZED CARGO is given a lift at New York's Idlewild Airport.

By ROBERT H. DAVIES

Vice President
Clark Equipment Company

Whether handling luggage, bandling equipment used by airlines plays a vital part in producing airlines' basic commodity—speed. No matter how swift the aircraft, if cargo handling procedures are inadequate—or become inadequate through inefficient utilization of methods and equipment—the advantage of air freight is

Getting the highest efficiency possible out of your mechanized materials handling equipment is basically a matter of good management. What are the major points to be considered in reaching this goal? It isn't difficult to enumerate them!

- Select the right equipment for the job.
- ▶ Use the equipment properly. Don't ask it to do too much (or too little).
- ▶ Make use of special attachments and other devices which will increase the usefulness of the equipment.

(Continued on Page 20)

* DESIGN FOR

By CHARLES D. WELSHENBACH

Sales Staff Engineer Hinde & Dauch



SEAWEED, CRACKED ICE, AND PRESERVATIVE keep lobsters alive and cool during flight.
Plypak lining, paraffined trays, and water-absorbent pads prevent leakage and insulate
the Lobster-Pak. Sixty-five-pound package contains 50 pounds of lobsters.



FORK LIFT TRUCK eases a pallet bearing 18 Lobster-Paks into the cargo hold of a United Air Lines airfreighter. Shipping lobsters in a barrel of brine is a thing of the past.

PAGE 10-AIR TRANSPORTATION-Air Commerce

How do you define a market area? It used to be that the manufacturer who couldn't sit down and pinpoint his primary and secondary markets on a map just wasn't in touch with his own sales picture. Not so today.

Today, the fellow who can plot an accurate outline of his markets is more the exception than the rule. Reason: Air freight—especially in the past 10 years—has given business men a whole new set of principles that are reshaping markets faster than most manufacturers can put pins in a wall map, and much, much faster than they can put salesmen in a branch office.

Zooming air transport is not only getting people around faster than ever before; it's also transplanting the local products, regional foods, the delicate perishables that have differentiated one area from another. Fact is, air freight is moving everything but climate itself.

But how did it happen? What makes a manufacturer turn to air freight to get his product across the country? And how does he keep it economical enough to be practical?

Packaging Factor

The answers are as varied as the products themselves. But probably the one factor that's most influenced the trend toward flying goods is packaging—with dozens of new twists on dozens of old applications shaped for a variety of individual packaging problems.

Take lobsters, for instance.

It used to be that the conventional "package" for shipment of live lobsters was a barrel of brine. But this technique posed some thorny problems. For one thing, barrels tend to leak, and merchandise which is shipped in the same load stands the risk of being brine-soaked. Secondly, barrels require careful handling because they tend to splinter or shatter when dropped. And finally, they're heavy, which in many cases prohibits air shipment entirely.

Because of these inherent deficiencies, it got to the point not long ago, where few airlines would permit the shipment of brine-filled casks. And this left lobster shippers with only the slower methods of shipment.

AIR SHIPPERS

This was the status quo when Hinde & Dauch, of Sandusky, Ohio, corrugated box producers, turned a hand to the design of a shipper which would eliminate the failings of the wooden keg, give lobsters the benefit of fast shipment and give commercial airlines the benefit of some profitable new volume.

Four years of H&D research preceded the actual design of the firm's Live Lobster-Pak®, a leak-proof corrugated box with some ingenious interior packing pieces to accommodate the lobsters.

The very nature of corrugated board made that material highly desirable for the new unit. It's inherently lightweight which makes it practicable for air shipment. It's much easier to store and assemble than the old wooden unit. And, of course, it is considerably less expensive.

The Obstacles

But the actual engineering of the box required that two more obstacles be overcome before the Lobster-Pak could become a practical success:

It had to keep the lobster cool and alive.

It had to eliminate brine leakage. These were problems assigned to the special interior packing pieces inside the regular slotted shipper. The pieces included Plypak® cushioning pads for the bottom, the top and all sides of the box, a pair of paraffined trays, and a series of special waterabsorbent pads.

Here's how one leading lobster shipper—Burroughs Sea Food Company, Boston—handles the packaging procedure.

From a single flat, the regular slotted box is quickly set up and the bottom is closed and taped. Next, a Plypak pad (made of multiple layers of thin corrugated board) is put on the bottom to cushion the contents. This is followed with a special water-absorbent pad. Plypak liners are put around the

(Continued on Page 18)

LIGHT WEIGHT and sturdiness are married in these specially designed containers for the airshipment of (1) frozen turkey, (2) live baby chicks, and (3) liquid gold paint.





CARTONS, crates, bales—all sizes, shapes, and weights—are handled with ease and speed. Reduced gross weight of shipments spells economy to the air cargo-minded shipper.

HOW TO PACK YOUR AIR SHIPMENT

By ROBERT BRASS

Assistant Director of Economic Planning, Seaboard & Western Airlines

With the Even-increasing volume of international air transportation the need for certain recommendations and suggestions for the packing of commodities for air freight shipment has become apparent.

Understandably, the stresses and strains imposed by air transportation are considerably less than those encountered in steamer transportation, and the absence of the corrosion and exposure to the elements factors enables the shipper to reduce his packing requirements. The savings derived from reduced gross weight, cheaper packing material and lower handling time are advantages which no astute shipper will overlook. However, it should be recognized that there is a minimum safety margin below which it is not advisable for the shipper to reduce his packing requirements.

It is true that stacking loads in an aircraft are less than in the hold of a vessel, and many other hazards are proportionately less. However, modern airplanes such as Seaboard & Western's all-cargo Super Constellations, (Concluded on Page 24)



WOODEN SKIDDING is used for heavy machinery.

PAGE 12-AIR TRANSPORTATION-Air Commerce

THE AIRBORNE MODULAR CONTAINER SYSTEM

MORE AND MORE SHIPPERS are recognizing the advantages of air transportation, and carriers the relative importance of air cargo to total revenue. As a result, operating economy is coming in for closer attention.

Lowered costs go hand in hand with increased efficiency in consolidating, loading and unloading cargo, and with maximum use of warehouse and aircraft cargo capacities. These, in turn, are achieved by development and use of materials handling systems and packaging designed specifically for the air cargo industry.

An important step in this direction, one that suggests wide commercial use, is the Airborne Modular Container System recently developed for the United States Air Force. The containers are reusable with secondary functions. Their modular dimensions and construction permit unit loads that help speed cargo handling and increase aircraft payloads.

The Air Force now is service testing large quantities of these containers to determine total Air Force requirements. Test movements with the new equipment were held earlier in Britain and in the United States.

The unique airborne containers were developed by Becker & Becker Associates, industrial packaging designers, of New York, Dayton, and London. Assignment by the Air Force was to increase mobility of operational units by improving Air Force packaging methods. The industrial packaging organization, which has successfully completed similar assignments for industry and the armed services, now is reviewing commercial applications for the containers.

In developing the system for the Air Force, Becker & Becker found many similarities between the shipments of military materiel and commercial cargo. The Air Force's cargo consisted of a wide assortment of individual boxes of assorted shapes and sizes, and often, custom-made, heavy wood crates. These boxes, because of variable dimensions, bulk, weight, construction, and quantities, seriously retarded efficient cargo transportation by air.

(Continued on Page 15)



FORK LIFT TRUCK handling a unit load.



UNIT LOAD alongside various sizes of cargo resting on elevator platform of airfreighter. Individual handling of the smaller containers is eliminated by consolidated unit loads.

Slow Office Procedures Can Slow Your Air Shipment

The shipper who specifies "via air cargo" for his consignment, then ties it in knots with outmoded procedures in getting out the paper work, is somewhat less than wise. He's like the racehorse owner who put a 200-pound jockey on his steed's back.

Teletype, the electric typewriter, the meter mailing machines, new filing systems, to mention only a few units of equipment, have come into play in the modern shipping and traffic office. And those shippers who have come to lean on air cargo more and more are learning by progressive stages that there is a direct link between speedy, accurate office detail and the physical dispatch of the airborne shipment.

Air freight forwarding firms with multiple offices have come to rely on the teletype system, an indispensable setup in relation to the inherent accent on speed in processing air shipments. Several months ago, for example, Emery Air Freight Corporation revealed that the private wire system connecting its 29 offices had been equipped with a fully automatic station selective device which enabled the company operator to type a message and leave the position unattended. The value of the device to the air shipper spoke for itself when it was shown that the message could be flashed to the Chicago switching center or to the station to which it was addressed without further attention. This freed the operator for

A visit to any smart traffic department or freight forwarding office—big or small—will find increasing reliance on new methods and new office equipment. This can range from a more efficient stapling machine or quick-tolocate card system to huge electronic "brains" for various operations.

We were discussing the air shipper with an executive of Remington Rand, and he promptly pointed to a case history concerning Airborne Flower & Freight Traffic, Inc. To quote John D. McPherson, Airborne's president:

Control Measures

"We are faced with meeting the same administrative requirements that any other enterprise must provide for, plus a few controls which are peculiar to the air freight forwarding industry. In 1951, to supplement our plans for expansion, we decided to adopt new measures for control and administration of our billing, accounts receivable, revenue accounting, and sales departments.

"Our revenue accounting is rather complicated, because the items of distribution per airbill are many. Separate cards are punched for each item of distribution on the airbill, the same items which determine the total charge for revenue receivable. A distinctive code, punched into each card, enables us to separate the distribution items, after a simple proving operation, on the high-speed sorting machines for tabulations of such revenue sources as air freight charges, pickup and delivery charges, amounts charged in advance for delivery outside the area of our present coverage, and insurance fees.

"From other cards we obtain amounts

Automation Goes With Air Cargo and analyses of our liabilities to shippers for cargo handled on a COD basis, and of declarations of value made by consignors. All these facts are extracted with mechanical speed and accuracy by our tabulating department.

"As a by-product of revenue accounting, we file airbill total cards to record charges to our stations and customer accounts. These cards are pulled to reduce balances due, when paid, and at the end of the month we tabulate open-items accounts receivable statements.

"As a further by-product of revenue accounting, we obtain analyses of revenue by shippers. This tabulation totals shipments by pieces and weight by shippers, and is logically correlated with our sales solicitation efforts by being posted to a Kardex Visible Rec-Our Kardex record has two pockets: sales calls are tallied onto the upper form, and revenue totals are posted to the form in the lower pocket. At a glance we can analyze the history of an account in detail. Signals on the pockets also graphically indicate, by date of last shipment, which shippers require this analysis and subsequent solicitation section.

"The nature of our business is such that we must call frequently on prospects and also on existing customers, in order that our name will be uppermost in a shipper's mind when cargo is to be forwarded. We therefore designed our Kardex form for posting three times monthly, with the appropriate 10-day totals furnished automatically by our tabulating machine from the revenue cards. We thus know the activity by any customer for each 10 days through the Kardex Visible Sig-

nal System and the information posted on the record itself.

"We use the Kardex as a means for controlling exchange of information between offices as regards sales leads. Leads are made up in duplicate—one copy going to the interested solicitor, and one is in the Kardex pocket.

"A further use of the punched-card revenue reports is made in totaling revenue by sales representative by assigned accounts. We are one of the few transportation companies paying commissions to salesmen.

"We have already proved to ourselves that we can increase our demands on the equipment without corresponding increases in cost. Management is now able to obtain information which hitherto was not economically feasible."

Only recently, Airborne introduced two-way radio communications between the company's district operations office in the new San Francisco International Air Cargo Terminal Building and Air borne trucks servicing the San Francisco, Oakland, and Peninsula areas. Airborne and its two subsidiaries—Airgo International Corporation and Green, Scott & Company, Inc.—operate a score of trucks in the Bay Area. All this in the name of streamlined operations.

MODULAR CONTAINER

(Continued from Page 13)

Loading at terminals required first consolidation of the shipment and then the manhandling of each box. Subsequent unloading again required individual handling at least once, and often, several times before the individual box reached its consignee.

Becasue of the containers' odd shapes and sizes, tiedown required extra close attention; bulk wasted space both in the cargoplane and warehouse; weight cut payloads.

The new freight containers designed for the Air Force are built in five standard sizes. Smallest container is 21 in. x 21 in. x 14 in. Largest is 42 in. x 42 in. x 14 in. Others are 21 in. x 21 in. x 28 in.; 21 in. x 42 in. x 28 in.; and, 42 in. x 21 in. x 14 in. Basic modular control dimensions are 21 in. x 42 in. laterally, and 14 in. x 28 in. vertically. These control dimensions allow a multitude of varying combinations of individual containers which, when consolidated, created a palletized unit load 42 in. by 42 in. which is keyed to the present requirements of anticipated carriers, both ground and air. As many as 20 of the individual containers can be consolidated into a unit load.

One of the requirements of the Air Force's packaging program was for a



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airFREIGHT Dept., Atlanta Airport, Atlanta, Georgia durable container that would lend itself to economical mass production. A new system of fabrication was selected. This system consists of using specially designed aluminum extrusions which by a single crimping operation form the container's framework as well as hold the panels rigidly without costly riveting or welding.

Panels are sandwich construction with aluminum skins bonded to a basswood core, and are 3/16 in. thick. Thus, they are tough yet light.

Recesses at the bottom of the containers and ridges at the top allow them to be interlocked and strapped vertically. When this is done, the boxes form a compact unit load that can be mechanically handled quickly and

(Concluded on Page 34)

AIRPORTS

(Continued from Page 8)

to the local Collector of Customs, Frank Peska. Initial designation is temporary, but will become permanent if the new Customs facilities are completed and in use at the end of the period.

Freight traffic at Seattle-Tacoma International Airport was reported at 1,981,664 pounds in January, in contrast to 1,660,292 pounds in January of last year. Express traffic dropped from 184,689 pounds to 169,800 pounds.

Congratulations

United States Airlines

American: James M. Glod, with AA for nearly two decades and holding cargo posts since 1944, appointed director of cargo services, replacing Frank W. Jones . . . F. J. Mullins elected vice president and general manager of AA's subsidiary, America Airlines de Mexico.

Braniff: Milton McGreevy elected to the board of directors.

Capital: James W. Austin, vice president-traffic and sales, elected a member of the board.

Pan American: Sydney R. Chichester, 13 years with Pan Am's cargo department, named cargo sales superintendent of the Latin American Division. He replaces Shelby W. Merrill, now an executive of Air Express International.



Cargo promotions: Glod of American (left) and Chichester of Pan Am

Resort: Robert A. Anderson appointed general sales manager.

United: Aksel Nielsen elected a member of the board.

Foreign Airlines

Air France: Joseph Saint Thomas promoted to Eastern District Agency manager . . . Pierre Digeon appointed local representative in Pittsburgh.

Varig: George P. Braender, previously district sales manager in Boston and New York for Braniff, appointed United States sales manager.

Aircraft

de Havilland Aircraft of Australia: Lester J. Brain, chief executive of Trans-Australia Airlines, named managing director of de Havilland.

Republic: Mundy I. Peale, president, awarded the Order of Merit of the Italian Republic, Italy's highest civilian award of merit.

Equipment

Harley Patents: Walter H. Dickman appointed vice president in charge of sales and engineering.

Organizations

Air Transport Association: Earl D. Johnson, president, named to receive the University of Denver School of Aeronautics' annual Achievement Award . . . Charles D. Ewing appointed assistant manager of ATA's Western regional offices.

Airport Operators Council: E. Thomas Burnard, ex-ATA, named executive secretary.

Materials Handling

Highlight of the three-day conference of the American Material Handling Society in Chicago (May 16-18) will be the presentation of new systems of materials handling to keep up with the growth of automation in the nation's factories. More than 200 companies will exhibit their products at the Sixth National Materials Handling Exposition (May 16-20) at the International Amphitheatre. The exposition is also sponsored by AMHS.

John D. Sheahan, of the materials handling consultant firm of Drake, Startzman. Sheahan, and Barclay, advises the establishment of a new executive post of "director of physical distribution" for multi-plant companies whose materials handling, warehousing, and transportation programs suffer from duplication and lack of integration. Standardization of handling procedures in a multi-plant company, he said, has at least three advantages:

▶ Efficiency of local management is raised to the extent its present practices fall short of standard.

Each local management is prepared to handle loads received from another plant.

▶ Uniformity in practices facilitates supervision and coordination.

The director would be responsible for all planning, scheduling, and control of all physical distribution activities, including materials handling, warehousing, packaging, transportation, and inventory management. The National Wooden Pallet Manufacturers Association has just approved a project to publish a set of grading and inspection rules which will serve as a valuable guide for pallet purchasers. A committee has been named to prepare these rules. It is expected that they will be ready by mid-1955.

Packaging

Every aspect of the \$10-billion-a-year packaging industry will be explored in Chicago the week of April 18 when the American Management Association holds the two major events of the packaging field—the 24th National Packaging Exposition and the Amnual AMA Packaging Conference. More than 30,000 persons will be on hand for the two programs. At the Palmer House April 18-20 some 1,500 specialists in packaging, shipping, traffic management, and materials handling will discuss packaging problems and techniques of a wide variety of industries. At the accompanying exposition in the International Amphitheatre (April 18-21) an estimated 30,000 visitors will tour more than three acres of exhibits showing the latest in equipment, materials, and services for the packaging, packing, and shipping of industrial and consumer goods.

The conference at the Palmer House will be the largest and most comprehensive ever staged in the packaging field by the 20,000-member management educational association. At 15 sessions spread over three full days more than 40 specakers will report the newest developments in packaging materials, machinery, and methods for almost every major American industry. In addition to the problems common to all businessmen who package products, the particular needs of manufacturers of specific goods will receive detailed attention in the conference sessions. This is the first time, according to the association, that the packaging problems of so many individual trade fields ever have been covered so comprehensively.

More than 380 exhibits already have reserved more than 95% of the 140,000 square feet laid out for the Packaging Exposition at the Amphitheatre. Thus, long before the doors swing open on the spectacle, the show had broken the size records set last year in Atlantic City, when 361 exhibitors occupied some 130,000 square feet of space. The attendance record was set in 1953 in Chicago, when more than 27,000 visitors thronged Navy Pier; this figure also is expected to be surpassed this year.

As compared to previous years, the 1954 exposition is expected to put greater emphasis on the packaging of industrial goods. Space reservations to date show a somewhat higher ratio of industrial to consumer package exhibitors than in the past.

Packaging, newly winning recognition as a major element in the operations of almost every business, will be scrutinized on a broad front in the conference sessions. Speakers will stress its growing ramifications for marketing, production, warehousing, and transport. Sessions designed for manufacturers of consumer goods will cover the new sales opportunities offered by an expanding economy and the changes in packaging techniques demanded by shifting distribution patterns. Cost reduction will receive primary emphasis in the industrial goods discussions, with attention to improved techniques and more efficient use of new and existing materials.



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APRIL 1955-PAGE 17

DESIGN FOR AIR

(Continued from Page 11)

sides. And a paraffined tray, along with three more absorbent pads, is inserted prior to loading the lobsters.

Next, 50 pounds of lobsters are packed and checked for weight, another absorbent pad is placed on top and covered with seaweed, cracked ice and a preservative to keep the lobsters alive and cool in transit. Still another absorbent pad, an additional paraffin tray, and a final Plypak pad complete the packaging operation and the box is closed and tied for shipment. The entire unit weights only 65 pounds.

Because of its compact size-19 in. x 19 in. x 161/4 in.-its light weight, and its conventional shape, the unit is especially easy to stack and handle.

But most important of all, it has successfully attained the major objectives of lobster shipment. Actual test shipments by three separate airlines confirmed the efficiency of the shipper prior to its wholesale production. Shipments up to 40 hours have since been made without leakage or damage to the contents.

And the success of this unit has prompted H&D's investigation into the production of a smaller unit of the same type, equipped with a convenient carry-home handle. This unit would hold eight or nine chicken lobsters, and may be refrigerated or not, as the duration of the trip requires.

Other seafoods, too, are flying into new markets in special corrugated shippers devised by the Sandusky packaging firm. A success story as dramatic as the development of the revolutionary Lobster-Pak is presented by a unique group of packages engineered for air shipment of famous Chesapeake Bay oysters. Insulpak®-a multiple-thickness corrugated material-is used in the boxes to provide both cushioning and insulation, thus eliminating the necessity of using ice or dry ice to maintain proper temperature.

Weight is Expensive

Here again, wooden kegs and barrels had been consistently used to ship the seafood. But the weight of the containers themselves, plus the added weight and bulk of the ice required to keep the oysters sufficiently cool, made long shipment an expensive proposi-

And again, Hinde-Dauch cooperated in engineering a package which would cut the expense of such shipments, improve packaging, handling and shipment of the products, and incidentally help to make ovsters an inland staple instead of a prohibitive luxury.

In an initial shipment, the Insulpak-ed boxes-without refrigerationwere packed with 144 pints of oysters and sent on an 11-hour air trip. They not only arrived in excellent condition; the temperature of the shipment increased only six degrees in transit.

The experimental shipment was undertaken cooperatively by the U. S. Fish and Wild Life Service, The Goodyear Tire and Rubber Co. (producers of Pliofilm®, used in pint-packaging the seafood), J. S. Darling & Sons (Chesapeake Bay oysters). The Great Atlantic & Pacific Tea Co., Shellmar Products Corporation, United Air Lines, Wayne University's Air Cargo Research Department, and Hinde &

The success of the oyster pack was attributed to two factors:

The small Pliofilm containers used to package the sea food in its own juice and prevent leakage.

The shipper's Insulpak liner which cushioned the Pliofilm containers and kept the temperature of the pre-chilled oysters stable. In addition, the inherent qualities of the corrugated shipper itself-light weight, ease of setup, com-



PAGE 18-AIR TRANSPORTATION-Air Commerce

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pactness - trimmed packaging, handling and shipping costs.

Similar Insulpak units have also been successfully adapted to the shipment of shrimp, Great Lakes white fish, and scores of other seafood delicacies.

But seafoods are not alone in their development of far-flung markets that a few years ago were not considered markets at all. Other products, too, have been ingeniously adapted to air shipment through the development of special shipping packages.

Baby chicks are a case in point.

Two requisites—speed and careful handling—dictate the techniques of chick shipment. Air travel itself accommodated the speed element; and a new H&D chick box, called the Air Liner, facilitated safe handling.

For example, older chick box models required the use of sticks placed between the units for ventilation when they are stacked for shipment or storage. But our package engineering devised a completely new box which eliminated this nuisance. Triangular corner posts and box dividers extend through the cover of the box to serve in lieu of sticks. In addition, the triangular posts give the corrugated box additional vertical strength and the dividers are provided with scored flanges which hold the cover firmly in place

without the necessity of stapling the unit shut.

Another significant feature of the Air Liner is the tapered sides—slanted slightly inward from bottom to top. This permits adequate ventilation through the boxes even though they are packed side-by-side when storage or shipping space is limited—an important factor in air shipment.

The capacity of properly designed corrugated boxes to keep chicks cheeping, lobsters active and oysters cool long enough to deliver them by air is reflected in the protection they offer other products as well.

Several varieties of poultry—frozen prior to shipment—are packed in Plypak or Insulpak-equipped corrugated shippers.

Poultry Shipper

One organization that was quick to discover the practicability of these H&D insulating materials was the Rockingham Poultry Marketing Cooperative, Inc., Broadway, Virginia. The Plypak-lined box used by the Coop facilitates packaging and freezing of hickory smoked turkeys and subsequent shipment to all parts of the United States and foreign countries.

The box and its full telescope cover

features double-thickness corrugated board on all sides; and Plypak pads both insulate and cushion the big birds in transit.

The Cooperative's packaging procedure works like this: The birds are packed in the lower portion which has been lined with Plypak on all sides and bottom. Next, the birds are frozen in the box and held for shipment. Then, just prior to shipment, a Plypak pad is placed on top, the full telescope cover is slipped on and stapling completes the packaging operation.

The efficiency of the shipper has been amply demonstrated in a number of actual shipments. In one six-week period, for example, some 7000 turkeys were shipped in the H&D units without a single report of damage to either the packages or their contents.

Although perishables probably head the list of products that travel by air, the variety of goods being air shipped is almost limitless.

So are the boxes in which those goods are shipped. While corrugated boxes are certainly designed with an educated eye to the means of transportation being used (as in the case of Lobster-Pak), the prime dictates of the package stem from the product itself.

An example of this principle is the (Concluded on Page 25)



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GETTING THE MOST

(Continued from Page 9)

- Insist on proper maintenance and service of handling equipment.
- ▶ Know when the "point of no return" is reached. Replace old machines for new before heavy maintenance costs pile up.

"Variety" is a one-word description of airlines' handling equipment needs. Belt conveyors are necessary for receiving, classifying and manifesting freight as it arrives. Pallets are necessary for temporary storage of freight in holding areas. Pallet racks are necessary to assure best space utilization. Fork trucks are needed to handle nallets in terminals and at plane doors. Trailers are needed to be used with tractors or fork trucks for moving loads to aircraft. Dollies and rollers may be needed for handling heavy machinery. Hand pallet and powered pallet trucks are needed for use in aircraft.

Of all these the fork lift truck is the most common piece of equipment used by airlines. Its mobility, liftability, and ease of operation make it an essential machine for the variety of handling chores found at an airport. It isn't necessary here to go into the fine points of fork truck selection—capacity, width,

upright heights, and so forth—since these requirements differ considerably from one installation to another. It is desirable, however, to mention two points which airlines may not be giving adequate consideration—the types of fork truck power available, and the use of special devices and attachments.

Four Types

Most fork truck manufacturers offer lour types of power — gas, electric, diesel, and liquefied petroleum gas (LP-gas). Again, gas power needs no elaboration here; it is by far the most widely used, not only by airlines but by industry generally, and its advantages are well understood.

Other types of fork truck power, however, may be well suited to certain airport handling operations. If fuel cost was the only factor involved, all fork trucks would probably be electric, for electric power is the cheapest available. The low-cost operation and longer life span of electric fork trucks usually offset their higher initial cost.

Of equal importance, the operating characteristics of electrics offer unique advantages; they are quiet, clean, fumefree, and operate efficiently under extreme conditions of heat or cold. This latter feature could be of significance at terminals located in vigorous cli-

A variation of electric power is the "Ready-Power" unit. Ready-power is a gasoline or diesel engine powered direct-current generator adaptable to electric fork trucks. The unit is a completely self-contained packaged assembly, fully automatic after a push-button start, and is used instead of battery power where necessary. The motor generator unit is a source of ready power at all times, eliminating necessity of spare batteries, chargers and related accessories.

Where can electric fork trucks be used advantageously? Practice has shown that gas-power is more efficient for long-haul runs - carrying palletloads from terminal storage to aircraft parked several hundred yards away, for example. But not all airport operations are long-run. In short-haul moving of palletized freight inside the terminal or in loading planes parked next to the terminal the economical operation of electrics pays off. An important point to remember is that electrics, because of their fewer moving parts, require less maintenance than gas-powered trucks.

The principal argument for diesel power is its safety and low cost; although not as cheap as electric power,



diesel fuel is less expensive than gasoline. And like gas-power, diesel is most effective for long outside runs.

The newest development in fork truck power is liquefied petroleum gas, or as it is commonly known, LP-Gas. In comparison to gasoline, LP-Gas has the advantages of lower fuel cost, less maintenance and longer engine life, and it does not produce harmful fumes. Originally designed for operation in areas where gas fumes would be dangerous, the economies of LP-Gas power have made it increasingly popular for many installations which normally would use gasoline.

In many instances where gasoline power is not desired, the choice lies between LP-Gas power and electric power. When this situation arises at an airport, an important point to consider is that LP-Gas trucks have a greater degree of flexibility than electrics. Battery-operated electrics are more or less restricted to areas which have battery-charging stations, while LP-Gas trucks can be transferred from one end of an airport to another at will.

LP-Gas powered fork truck (and electrics), because of their fumeless operation, are especially suited for work around people in closed areas—in terminal storage areas or luggage pick-up stations, for example.

To summarize—it is probable, and properly so, that gas-powered fork trucks will remain as the backbone of airport handling equipment. Yet there are specific advantages in other types of fork truck power, and there are certain areas of airport handling in which these types can be advantageously employed. Determining the most efficient application is one step toward a more effective handling program.

Automatic Drive

A second point airlines may overlook is the desirability of specifying clutchless automatic drives for fork trucks. Most fork truck manufacturers offer some variation of automatic drive. Clark Equipment Company's Hydratork Drive, as an example, utilizes the principle of torque conversion, which is well known to the aviation industry. Hydratork consists of two basic elements: a torque converter and a new type of fork truck transmission which eliminates the need for manual or automatic gear shifting. Power from the motor is automatically multiplied to meet changing power-requirements initial acceleration of a heavy load from a full stop, for instance, or for climbing grades.

For use at airports, automatic drive offers several important advantages:

▶ Easy operation. This is important where untrained drivers must be used, or where many different drivers use the same machine.

▶ Lower maintenance costs. Elimination of clutch wear-and-tear saves considerably on service bills.

▶ Smooth acceleration prevents load damage due to jerky starts, and reduces possibility of damage to aircraft from abrupt acceleration while loading freight.

• Greater controlled power for unusually heavy jobs.

Approximately the same advantages apply to fluid couplings used on towing tractors. This feature, available on some models, is standard equipment on Clark tractors. Use of a fluid coupling is especially advantageous when breaking away a heavy load from standstill since it insures smooth application of full drawbar pull. The fluid coupling prevents loss of torque from the engine, thus permitting full engine power to be applied to the work. When the initial pull is completed and the load is in motion, drawbar pull drops to about half of the starting effort, permitting the fluid coupling to operate at a low temperature. With a fluid coupling the clutch is disengaged only when entering or changing gears.

The advantages of both automatic

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-

drive for fork trucks and fluid couplings for tractors should be considered when planning or re-planning airport handling procedures. In most instances economies can be gained through their utilization.

Fork trucks are not only "fork" trucks. The list of attachments which can be substituted for forks is indeed a lengthy one. Clark alone manufactures more than 20 different handling devices. Few of them, however, are even seen around airports. With the current emphasis on palletized freight, forks are all that are necessary.

Special Attachments

When unpalletized handling is desirable or necessary, however, special attachments can often be utilized. Several examples will illustrate this point:

▶ Machinery or other heavy, bulky items can be handled with a crane attachment quickly substituted for forks;

▶ Tires, wheels, round castings and items of similar shape can be carried and loaded with a ram attachment;

▶ Large cartons and bales are easily handled with any one of several clamp attachments:

▶ Use of paper pallets, with a Pul-Pac attachment for handling, can save an appreciable amount of valuable cargo space. Don't forget that fork trucks need not be restricted to handling duties. With such attachments as sweepers or snow plows, they become utility trucks performing "extra" functions at little extra cost.

Consideration of fork truck attachments to increase machine utility is another step toward efficient utilization of handling equipment.

Above all else, the one activity which will increase the effectiveness of your materials handling fleet is the establishment of a thorough, consistent preventive maintenance program. The importance of this cannot be overstressed. Too frequently no consideration is given to preventive maintenance and the cause of machine failures. It is too common a practice to operate a vehicle until it breaks down and requires a major repair. If a little foresight had been used, a major repair would not have been necessary.

A rigid preventive maintenance program is a major step in securing from your materials handling equipment all of the service which was built into it. To paraphrase—an ounce of preventive maintenance is worth many pounds of breakdown and major overhaul cure. In order to maintain handling operations at the highest efficiency and prolong the life of each vehicle, it is com-

pulsory that preventive maintenance be performed regularly and systematically. This work should be done by qualified mechanics under competent supervision. A complete record of all service done should be kept, as only through such records can a proper check be kept.

The time and effort required to maintain a preventive maintenance program is mandatory to reduce to a minimum the time lost while a vehicle is in a repair shop.

Since a major cause of equipment breakdown is careless operation, a logical supplement to sound maintenance is an operator training program. Such a program is necessary for airlines on at least two counts:

Rapid turnover of fork truck drivers and other equipment operators brings a more-or-less constant influx of inexperienced, untrained labor.

▶ Round-the-clock operation means that each machine is subjected to the varying driving habits of several operators.

Techniques

Admittedly, these same reasons make it difficult to implement a thoroughly comprehensive training program, yet adequate training can be obtained with some simple, inexpensive techniques. Fork truck manufacturers will gladly furnish driver manuals, safety suggestions and illustrative material on proper fork truck operation. Educational movies can be obtained free. Equipment suppliers are always available to give talks and lectures, and will even assist in setting up "obstacle courses" on which new drivers can practice.

It is advisable that, like preventive maintenance, driver training programs be continuing. From time to time safety quizzes, driver tests and similar devices can be utilized in "refresher" courses, not only to keep operators alert, but to weed out incompetent operators.

The procedures and programs discussed so far are designed to increase the utility and prolong the life of your materials handling equipment. But in spite of even the most tenacious adherence to these suggestions, the rugged daily wear-and-tear incurred by your machines eventually will raise maintenance and repair bills to the point where it becomes advisable to replace the machine. When is this point reached?

Speaking generally, a gas-powered fork truck will perform efficiently under normally heavy conditions for a period of five to seven years. Electric-powered trucks will last from seven to nine years. It must be understood, however, that these figures represent a general average, and that wide deviations

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from this "normal expectancy" are common. Many electric trucks, for example, are still performing capably after 15 years of hard service.

It is not the age but the maintenance record and general condition of a fork truck-or any other piece of handling equipment—that determines its further usefulness. And these factors will always vary with individual trucks. As a general rule-of-thumb, however, the following pattern can be established:

Some time between the second and fourth year of operation, a gas-powered fork truck will need a thorough overhaul. Two or three years later, a second overhaul will be required. It is at this point that an analysis should be made of the two factors cited above to determine the advisability of replacement. If the general condition of the machine is poor, and past maintenance records indicate that future repair bills will be high, then the machine should be replaced. If the opposite is true, then the expense of a second overhaul will be justified. Third overhauls are seldom advisable.

Replacing Equipment

When a decision has been made to replace a machine, a thought should be given to the practicality of keeping the old machine as a "spare" rather than trading it in for a few hundred dollars. Semi-retired fork trucks need little or no maintenance, yet can be very useful for handling odd jobs, as extra equipment during peak periods, or as substitutes for machines tied up in the maintenance shop. Whether or not having a spare truck available for such emergencies is worth the sacrifice of a trade-in allowance will depend upon the nature of the operation.

Obsolescence is a word well understood in the aviation industry. The most up-to-date aircraft may become obsolete almost overnight as new designs and new theories become known. The same thing can happen in the materials handling field, and good management demands that new methods be examined and tried when higher efficiency can be obtained

Two new materials handling techniques that have potentialities for airport handling are the use of straddle carriers for fast horizontal movement of goods, and the "Mobilvan" system recently announced by Clark Equipment Company.

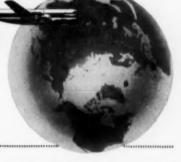
Originally designed for carrying lumber, the high-bodied, spidery-looking straddle carrier is now receiving industry-wide recognition as a highly efficient, low-cost means of transporting materials horizontally. With one man as operator, the carrier can load itself in five seconds, unload in three seconds, carry a payload of 50,000 pounds and almost any length, and travel over the road at speeds up to 56 miles per hour.

These performance characteristics can be utilized in airport handling at several points. As a substitute for tractortrains, a carrier can pick up palletized freight in terminal storage and in a few moments deliver it alongside aircraft for loading. The carrier can be used to transfer freight (or maintenance sup-

plies, parts and other materials) from one storage area to another, or between hangars - moving in a few minutes from one end to the other of even the largest airport.

A more dramatic application - and one which is being considered by at least one airline-is the use of carriers to move "passenger pods" from terminals to passenger planes. Covered "pods" would contain seats and luggage space, and provide quick, convenient means of getting passengers to

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their planes — especially in harsh weather. One reason for experimentation with this method is the anticipated problem of moving passengers to jet aircraft which necessarily will have to be parked considerable distances from terminals.

The Clark Mobilvan System is based on the use of a lightweight van measuring 17 ft. x 8 ft. x 8 ft. and having a capacity of 20,000 pounds. Automatic locking devices enable it to be fastened securely to the bed of a railroad flatcar or the body of a flatbed highway truck. The van is moved by fork truck or straddle carrier.

Merchandise is loaded into the van at a shipper's loading dock, and the van is transferred to a flatcar or flatbed trailer for transport to its destination. Here the van is transferred to the dock and emptied at the convenience of the receiver. An important advantage of the Mobilvan is that, unlike a conventional highway trailer, it can be used for storage indefinitely.

One conception being considered is use of the van as a cargo unit. All parcels for one city-or one area in a city-would be loaded into the van and sorted for delivery. The van would be lifted aboard a plane by fork truck, and at the destination removed by the same method and immediately placed on a flatbed city delivery truck. Within moments after the aircraft landed the freight would be on its way to the consignees. This method would eliminate handling of the freight at the destination-airport and shorten delivery time. For this purpose vans could be made any size necessary.

HOW TO PACK

carry a payload greater than a freight car. Thus, each package for air transport must be designed and constructed so that it will withstand normal stacking. In addition, it must be borne in mind that although the cargo in an aircraft is onloaded and offloaded with the utmost care, the shipments must be transported to or from the air terminal. This usually involves surface transportation of some sort and attendant packing strains.

The possibility of crushing, breakage or pilferage during air transportation, while remote, does exist and suitable protection is therefore necessary.

It would be impossible to establish a definite set of container specifications for air freight due to the diversification of the commodities involved. The container types discussed in the following pages are the sort most commonly used for air freight packing and they are suggested where suited to the needs of the commodity and where the load is within the suggested weight limits.

Fiberboard cartons: The cheapest and lightest of the materials is the corrugated and solid types of fiberboard containers. In both types there is a wide variety available according to strength required in terms of bursting test of pounds per square inch. In the corrugated carton there is additional variance in direction and frequency of fluting. The solid fiberboard containers are available in waterproofed type, used extensively by the armed services for air freight packing during World War II and called V-Board. The fiberboard containers are far and away the most commonly used for present day air freight. Their utility is limited only by the density factor of the commodity to be packed. By building unusual strength into strategic points for palletization and handling with power equipment, heavy bulk loads can be safely accommodated. For example, a carburetor manufacturer is utilizing a fiberboard container strapped to a wooden pallet for shipments totaling 1,000 pounds per unit.

▶ Wirebound boxes: The wirebounds are made of thin wood slats held together by heavy-gauge wire. This type of container is tremendously useful for the packing of heavy items, such as machinery, and can be used for shipments weighing as much as 3,500 pounds. Although heavier and more expensive than fiberboard they are considerably lighter and cheaper than the wood casing which would be required for steamer transportation for the same item.

▶ Burlap: The burlapped bale can be utilized for those items requiring compression in packing such as raw furs. Burlap has great value too as an outside covering for commodities packed in fiberboard containers as a deterrent against pilferage.

▶ Plywood: The plywood veneer box affords the shipper of heavier items the best compromise for weight and strength. A properly constructed plywood box can successfully accommodate all but the heaviest items. This material is also used quite extensively by the armed services for air freight shipping.

▶ Skidding: For engines and machinery weighing over one ton per unit, wooden skidding is recommended. The heavy wooden bases, to which the machine is bolted, spread the load over a wider floor area, overcoming floor loading limitations. The machine itself may be covered with a plastic material, a variety of which are available.

Various container manufacturers have done research into special containers for air freight shipment of particular commodities.

Tropical fish are being successfully flown in a new type corrugated shipping container. Developed by Gaylord Container Corporation, the telescopetype container utilizes a one-piece inner sleeve of waterproof corrugated board to form a "tank." Holes are punched through the top to permit insertion of a rubber "snorkel" tube directly into the water to ensure adequate oxygen for the fish. Large savings in weight and space have been achieved.

A highly efficient chick box for the air transportation of live baby chicks has been developed by Hinde & Dauch. This sloping side, stitchless box has precision top and side perforations to provide the last word in chick box entilation. Four corner posts add stability and eliminate rocking when boxes are stacked. (See Design for Air Shippers in this issue.)

Wearing Apparel

A shipping container for dresses or other wearing apparel, constructed of corrugated cardboard has appeared on the market. Various types are available and all feature light weight and compactness. The dresses or other articles are hung on individual hangers, eliminating wrinkling while in transit. The container is completely sealed, keeping contents free of dust and alien odors. Dresses, upon arrival, can be placed immediately on display, since they require no pressing or spotting.

It is recognized that many firms making the transition from steamer to air transportation have encountered serious packing problems. It is possible that the particular commodity does not lend itself to a standard type container, or that there is doubt as to the advisability of reducing packing at all when making air shipment.

In this regard, our company has completed arrangements with several of our foremost container manufacturers to provide their expert advice on any packing problems we submit to them. If necessary, a container will be designed to combine light weight, ease of assembly, and strength and protection congruent to strains and stresses experienced in air freight transportation. After thorough testing in their research laboratories and approval by the packing engineers, the newly designed container, prices, specifications, and delivery information will be submitted-all without obligation to the shipper. This service is provided by Seaboard & Western's Packaging Department.

DESIGN FOR AIR

(Continued from Page 19)

shipper being used by Hanovia Chemical Manufacturing Company, East Newark, N. J., to ship liquid gold paint. H&D package engineers who designed the box started with the product-100 gram, half-pound and pound bottles of the valuable liquid finishes. Protection of the merchandise was the prime consideration. With this in mind, the experts originated a cellular interior packing arrangement into which two dozen of the bottles could ride comfortably without shifting in transit. Extension partitions insulate the bottles from the sides of the box. And a multiple-thickness, corrugated Plypak pad is placed on top and hottom to cushion the fragile vials.

Although the box is adaptable to

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nearly all methods of shipment, its light weight and compactness especially fit it for air transport. Hanovia reports that not one of the bottles of metal finish has broken in transit since the box was adopted.

Commercial airlines have, of course, taken an active interest in the new packaging techniques which Hinde & Dauch is employing to adapt various products to flight shipment. One, in fact, has become so enthusiastic over the insulating performance of H&D's Insulpak that it has adapted the product to an airline packaging problem.

United Air Lines uses regular slotted boxes, equipped with Insulpak liners. to pack hot and cold foods for Mainliner passengers. The product needs no further insulation and additional cooling or heating is unnecessary. The boxes are simply packed with the Mainliner fare - which ranges from filet mignon to stuffed mountain trout -sealed, and stored until time to

Still another Hinde & Dauch development which has furthered the efficiency of air shipment is Flexpak®, a corrugated wrapping material that combines the shock-absorbing qualities of corrugated board with the facility of wrapping paper.

Manufacturers who produce especially fragile items are discovering that Flexpak speeds packing time, assures positive protection for irregular-shaped items, and makes an unusually compact package. In many cases, Flexpak has eliminated the necessity of excelsior packing, thus reducing the size of the package and conserving valuable storage and freight space.

The larger capacities (and larger fleets) being made available for air shipment of a wide variety of previously surface-shipped items is still outlining new tasks for package engineers. In some cases, a simple new approach to an old packaging technique will be sufficient to arm individual packages to air travel. In others, completely new shippers employing new trends in box design will be called for. But in either event, the objectives are fast being defined and further progress in air packaging is simply a matter of time

Air freight, in effect, has unearthed a brand new industrial frontier. Springing from infancy to young manhood in World War II, the air transport industry has since illustrated its ability to explore and expand profitable new markets.

And corrugated board-in the hands of packaging experts-has aptly demonstrated its versatility in accommodating this dramatic trend.

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HIPPING * * AIR

International Airline Cargo Rates

(including U. S. possessions and territories)

Air cargo rates quoted in this section refer only to points served direct by carriers, or by transhipment aboard aircraft of the sens company. Interline agreements among most carriers easible shippers to route their cargoes via connecting airlines to nearly every part of the world. Rates are based on prevailing tariffs, airport to airport (see note). Shippers are warried, however, that these rates are subject

Shippers are wanged, nowever, to change.

All international rates are quoted on an airport-to-airport service, with the pickup and delivery charges wholly apart.

Air carriers whose schedules and rates are included here are indicated by the letter following the airport symbol (see

AIRPORT	SYMBOLS
ACG Anchorage	MEX-Mexico City
BAL Baltimors	MIA-Miami
MGR-Bangor Me	MKE-Milwaukee
BUJ-Beaumont, Tex.	MSP-Minneapolis-St. Paul
808-Boston	MOB-Mobile
#80 Browneville, Tex.	YML-Montreal
BTV —Burlington, Vt.	MSY-New Orleans
CHS-Charleston, S. C.	LGA-New York (La Guard
CHI-Chicago	IDL-New York (Idlewild)
CLE-Cleveland	EWR-Newark
CRP-Cornin Christi, Tex.	ORF-Norfolk
CTB Cut Bank Mont.	NLD-Nuevo Laredo, Mex.
DAL-Dallas	NLD-Nuevo Laredo, Mex. OAK-Oakland, Calif.
DEN-Denver	OMA-Omaha, Nebr.
VIP-Detroit	PUK-Paducah, Ky.
DLH-Duluth	PIA-Peoria, III.
ELD-El Dorado, Ark.	PHL-Philadelphia
ELP-El Paso	PIT-Pittsburgh
EVVEvansville, Ind.	PDX-Portland, Ore.
FWA-Fort Wayne, Ind.	PVD Providence
FTW-Fort Worth	YOY-Sydney, N. S. STL-St. Louis
GFK-Grand Forks, N. D.	STL-St. Louis
GRW-Greenwood, Mim.	PIE St. Petersburg
BDL-Hartford	SLC-Salt Lake City
HAV-Havana	SAT-San Antonio
HOT-Hot Springs, Ark.	SFO-San Francisco
HOU—Houston	SAV -Savannah
HOT — Hot Springs, Ark. HOU—Houston HNL—Honolulu IND—Indianapolie	SEA Seattle SHV Shreveport, La. GEG Spokane, Wash.
IND-Indianapolis	SHV-Shreveport, La.
JAP Jackson, 25 im.	GEG-Spokane, Wash.
JAX-Jacksonville	SQF - Springfield, Mo.
MKC-Kansas City, Mo.	TPA-Tampa
KIN-Kingston, Jam.	HUF-Terre Haute, Ind.
LRD—Laredo	TOL-Toledo, Ohio
LIT-Little Rock, Ark.	YTO-Toronto Out.
LAX-Los Angeles	YVB-Vancouver B. C.
MEM-Memphia	DCA-Washington D. C.

AIRLINE SYMBOLS
A—American Airlines
AF—Air France
AS—Astorias Sud Americana
AV—Aviana
AV—Aviana
AV—Aviana
AV—Aviana
AV—Aviana
AVIIII (Ltd.
B—Braiff International Airways
BO—British Overseas Airways
Corp.
BZ—Brailisa International Airways
C—Colonial Airlines
CO—Delta-C, & S. Air Lines
E—Eastern Air Lines

AIRLINE SYMBOLS

EA-Expreso Aereo Interamericano
EL-El Al (Israel Airlines)
1 Icelandic Airlines
18 Iberia Air Lines
J-Japan Airlines
K-KLM Royal Dutch Airlines
L-Lineas Aereas Mexicanas (LAMSA)
LA-Lineas Aereas Costarricenses (LACSA)
LI-Linee Aeree Italiane (Italian Airlines)
LV-Lineas Aeropostal Venesolana
N-National Airlines
NE-Northeast Airlines
NW-Northwest Airlines
P-Pan American World Airways and Panagra
O Ountag Empire Airways
Q - Qantas Empire Airways R - Riddle Airlines
AN -RANSA
8—Sabena Belgian Airlines
\$5 - Scandinavian Airlines System
SW-Seaboard & Western Airlines
SR-Swiosair
T-Trans-Canada Air Lines
TA-TACA International Airlines
TL-Transocean Air Lines
TN-TAN Airlines
TW-Trans World Airlines
U-United Air Lines
W-Western Air Lines
AA - AA GROELII VIL TURER

SPECIAL NOTES SPECIAL NOTES
COMMODITY RATES: Apply to sirlines.
TRANSATLANTIC FREIGHT VIA IATA CARRIERS—
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AF: Valuation charge is applicable only on shipments equa to or more than \$7.48 per pound.

to or more than \$7.48 per pound.

K: Valuation charge is only on shipments with a declared valuation in excess of \$7.48 per lb.

L: Shipments of less than 22 lbs. are sent air express.

P: Valuation charge is only on shipments with a declared valuation in excess of \$7.48 per lb.

vanuacon in excess or 57.48 per 1b.

T: More economical rates are offered for bulk cargo. There is a basic rate for cargoes 25 pounds and less, between 2: pounds and 100 pounds, and over 100 pounds. Consult the sirline direct.

TC: Cheaper "deferred" rate available. Contact airlin

RATE SYMBOLS

* This involves onward carriage by another airline.

* Per \$100 (Canadian Currency) value, pro-rata.

\$ Minimum charge for this shipment is that for 25 lbs.

* Rate of 25 lbs. or less.

* Minimum weight 50 lbs.

* Per hundred/weight.

* Minimum charge per shipment \$4.00.

\$\$ Minimum charge per shipment \$7.00.

\$\$ Minimum charge per shipment \$8.90.

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\$\$ Minimum charge

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Destination

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Antigua, B.W.L...

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YML AF
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YML K
IDL SW

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			RATES se Note)						RATES se Note	i i				(See Note)			
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Bahia, Brazil (See S. Bahrein, Arabia	IDL. BO BOS BO IDL. SR BOS BO IDL. SR IDL. S	1 63 1 91 1 1 93 1 1 1 1	1 45 1 43 1 45 1 45 1 45 1 45 1 45 1 45	25 25 26 25 25 25 25 25 25 25 25 25 25 25 25 25	M.W.F.Sa Dly except T1 Su.T.Th Su.T.Th T.Th.Sa M.Th Sa Sa Sa Sa W.Sa U.Sa U.Sa U.Sa U.Sa U.Sa U.Sa U.Sa U	Bastia, Corsica Bayamo, Cuba Beirut, Lebanon Belem, Brazil Belfast, N. Irelan Relgade, Yugoelavia Belize, Br. Hond.	MIA B BOS B IDL S IDL S IDL E BOS B IDL E IDL E MSY T MEL I	1 99 1 99 1 9	200 373 443 377 477 477 477 477 477 477 477	285 285 285 285 285 285 285 285 285 285	Su, T Su, T Su, T M, Su Dly ex. M, T F F Dly except F Su W, Su W, Su Su W, F, Su Su Su W, F, Su Su W, F, Su Su W, F, Su Su W, F, Su Su W, F, Su Su Su W, F, Su Su Su Su Su Su Su Su Su Su Su Su Su S	Bonaire, N.W.I. Bordeaux, France Brazzaville, Fr. Eq. Af.	BOS BE HOLE BOS BE HOLE BOS BE HOLE BOS ALL CHI ALL SE HOLE BOS ALL CHI ALL SE HOLE BOS BE HOLD BOS BE	1.33 1.55 1.55 1.55 1.55 1.55 1.55 1.55	1 77 1 1 5 6 6 1 1 1 1 1 5 6 6 1 1 1 1 1 1 1	\$ 0 100 100 100 100 100 100 100 100 100	Su, F. Sa Dly Dly Th, Sa Dly Dly W, Sa Dly W, Sa Su, W, F. Sa Dly S, W, W, F. Sa Dly S, W, W, F. Sa Dly S, W, Sa Su, Su, Su, Su Su, Su, Su Su Su, Su S

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			RATES on Note	0)				(8			RATES (See Note)						
Destination	Airport and Airline	Per Lb. (Un- der 100 Lbs.)	Per Lib. (Over 100 Libe.)	Pur \$100 Value	Depart	Destination	Airport and Airline	Per Lb. (Under 100 Lbs.)	Per Lh. (Over 100 Lhs.)	Por \$106 Value	Depart	Destination	Airport and Airline	Per Lb. (Un- der 106 Lbs.)	Per Lh. (Over 100 Lbs.)	Por \$100 Value	Depar:
Susaramanga, Colombia Bukaru, Bel, Congo Susaso Airea, Argentian Bukayu, Bel, Congo Susaso Airea, Argentian Cagliari, Italy Casharian, Culm Castarian, Culm Castarian, Culm Canada Callarian, Culm Canada Can	LAX P BFO P PDX P BEA P YVR Q IDL BO BOS BO	1 17 1 17 1 17 1 17 1 17 1 18 1 17 1 1 17 1 1 17 1 1 17 1 1 17 1 1 17 1 1 17 1 1 1 17 1	## S	20	Diy Diy cs. M,T M, W,Th,F T,Th T,Th M, W M, Sa Su, W,Sa Su,T, W,Sa Sa W,Sa W,Sa W,Sa W,Sa Diy cs. M,T Diy Diy Diy Diy cs. Th,Sa Diy Diy Su,Th,Sa Diy M, W,F Su Su,W,Sa Su,W,Sa Su	Cayenne, Fr. Guiana Cayo Mambi, Cuba Chetmual, Mexico Chittagong, Pak. Christianand, Norway C. del Carmen, Mexico Mexico Cindad Trujillo, DR. Cochabamba, Bolivia Cologne, Germany Cologne, Germany Concepcion, Bolivia Concepcion, Bolivia Concepcion, Bolivia Concepcion, Den. Concepcion, Concepcion, Concepcion, Concepcion, Concepcion, Bolivia Concepcion, Bolivia Concepcion, Bolivia Concepcion, Bolivia	MIA P BRO P HOU P LAX P HOU P LAX P IDL BO IDL K YML K IDL S IDL S IDL S MIA P	2 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	\$33 448 488 888 888 888 888 888 888 888 8	15 15 15 15 15 15 15 15	Su, W. Th. Sa Dily Dily T. F Dily except M T. Th. Sa M. F T. Th. Su W. F W. Sa Su. Th T. W. Th. Sa, Su Sa W. Sa	Firi Islands Fiorianopolis, Brax Fort Archambault, Fr. E. Afr. Fort Dauphiu, Ma	DIL BO BOS BOS BOS BOS BOS BOS BOS BOS BOS	1.74 1.81 1.74 1.81 1.74 1.81 1.75 1.75 1.75 1.75 1.75 1.75 1.75 1.7	1.30	25 25 25 25 25 25 25 25 25 25 25 25 25 2	Dly W.Sa W.Sa W.Sa W.Sa Sa,T.F. Dly Dly Dly Dly Dly Dly M.Th.Sa M.Th.Sa Su Dly Th.Sa Su T.Sa Su T.Sa Su T.Sa Su T.Sa Su T.Sa Su T.Sa T.Sa T.Sa T.Sa T.Sa W.F Su W.F Su W.Sa W.Sa W.Sa W.Sa W.Sa W.Sa W.Sa W.Sa

		RATE (See No							RATES ee Not					RATES (See Note)			
Destination	Airport and Airline	Per Lb. (Under 100 Lbs.)	Per Lh. (Over 100 Lhs.)	Per \$100 Value	Depart	Destination	Airport and Airline	Per Lb. (Un- der 100 Lbs.)	Per Lh. (Over 100 Lhs.)	Per \$100 Value	Depart	Destination	Airport and Airline	Per Lh. (Un- der 100 Lbs.)	Per Lib. (Over)	Per \$100 Value	Depart
Fort William, Ontario, Can. Fortalean (Ceara), Brasil Frankfurt-on-Main, Germany Freetown, Sierra Leone Gander, N. F. Geneva, Switzerland Geneva, Switzerland Grongetown, British Guiana Gibraltar, Gibraltar Glasgow, Scotland	IDL. SR IDL. BO IDL. SS IDL. SS IDL. AF BOS AF YML AF YML AF IDL. TOL. TOL. TOL. TOL. TOL. TOL. TOL. TO	13 1 399 1 23 1 444 2 600 1 1 22 1 702 2 71 2 72 1 1 244 1 244 1 244 1 244 1 244 1 244 1 244 1 244 1 244 1 244 1 244 1 244 1 2	1 23 1 44 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	200 200 200 200 200 200 200 200 200 200	Diy except M T.Th.Sa M.F. Su.T.Th Su.T.Th M.W.F. Diy Diy Diy Diy Diy Diy Diy Diy Sexept W Diy Sexept W T.Sa Diy Sexept W T.Sa Diy Sexept W Diy Sexept W Sexe	Goma, Bel. Congo. Gothenburg, Sweder Goyania, Brazil Granada, B.W.I. Guadalajara, Mex. Guadaloupe, F.W.I. Guam Guatanamo, Cuba. Guatanamala City, Guatanala Guayaquil, Ecuador Haifa, Israel Haifa, Israel Haifa, Rermany Hamburg, Germany Hanover, Germany Hanover, Germany	IDL. SR IDL. BO BOS BO MIA BS MIA BS IDL. BO MIA P MSY B MSY P MSY P MSY P MSY P MSY P MSY T MSY P MSY T M	2 14 1 25 1 1 25 2 1 1 25 2 2 1 1 2 2 2 2 1 1 2 2 2 2	38 58 56 61 49 48 58 40 1 32 1 32 1 32 1 32 5 60 94 94 94 92 1 19 94 92 1 19 15 15 15 15 15 15 15 15 15 15 15 15 15	25 25 25 20 20 07 07 72 00 08 18 18 18 18 18 18 18 18 18 18 18 18 18	Su,Th Dly Su,Th Dly W,Sa Dly W,Sa Dly W,Sa Th M,F	Havana (Cont'd) Helaiaki, Finland. Hermosillo, Mexico Holquin, Cuba Hong Kong, Br. Crn. Col.	HOU DC MSY DC MSY DC MSY DC MSY DC MSY DC MSY DC NDD DC BUJ DC EVV DC FVW DC FVW DC FVW DC FVW DC MCC MCC MCC MCC MCC MCC MCC MCC MCC M	19 14 19 19 19 20 17 20 17 19 20 20 21 68 68	15 11 11 11 15 16 16 16 16 16 16 16 16 16 16 16 16 16	08 05 05 05 06 06 06 06 06 06 06 06 06 06 06 06 06	Dly



			RATES ee Not						RATES ee Note	2)		RATES (See Note)					
Destination	Airport and Airline	Per Lb. (Un- der 100 Lbs.)	Per Lb. Over 100 Lbs.	Per \$100 Value	Depart	Destination	Airport and Airline	Per Lb. (Un- der 100 Lbs.)	Per Lb. (Over 100 Lbs.)	Per \$100 Value	Depart	Destination	Airport and Airline	Per Lb. (Un- der 100 Lbs.)	Per Lb. Over 100 Lbs.	Per \$106 Value	Depart
Manila (Cont'd) Manilales, Colombia Manono, Beigian Congo Manta, Ecuador	MKE NW MSP NW PDX NW SEA NW IDL AF BOS AF CHI AF YML AF IDL AV MIA AV BRO P HOU P MSY P IDL S	2.64	2 42 48 41 48 48 45	20 20 20 20 25 25 25 25 15 15	W.F.Su W.F.Su W.F.Su W.F.Su Sa Sa W.Sa Dly Su,M.T.W.F M.Th.Sa Su,W M.F.Su	Mexico City (Cont'd	DAL ASSELP ASAT ASSELPATION ASSELPT ASSELPT ASSELPT ASSELPT ASSELPT ASSELPT ASSELPT ASAT ASSELPT ASSELPT ASSELPT ASSELPT ASSELPT ASSELPT ASSELPT ASSELT A	29 20 30 20 15 35 1 33 1 33 1 39 1 29 1 33 1 33 1 33 1 33 1 33	24 16 25 16 11 28 1 00 1 00 99 1 05 97 1 00 97 1 00 97 1 00 97	15 15 15 15 15 25 25 25 25 25 25 20 20 25 25 25	Diy Dly Dly Dly Dly Dly Dly Ba W.Sa T.Th,Sa,Su Dly W.F,Sa T.W.F Su W.F,Sa	Munich, Germany	IDL PHOS PIDL SS LAX SS IDL SIDL AF BOS AF CHI AF IDL KYML AF IDL SR IDL SW IDL BO IDL BO MIA BO MIA BO	1 31 1 28 1 31 1 57 1 31 1 39 1 36 1 26 1 30 1 26 1 31 90 1 31 2 09 2 18	98 97 98 1 24 98 98 97 1 03 95 96 96 98 97 1 62	20 20 20 25 25 25 25 25 20 22 25 20 20 20 22 25 25 25 25 25 25 25 25 25 25 25 25	Dly Dly M, Th T, Th, Su T, W, Th, Sa Sa W, Sa W, Sa Dly W, F, Sa Dly Dly Dly Dly Dly
Maracaibo, Cuba Maracaibo, Venezuela """ Maracille, France """ Martinique, Fr. W. Ind. Matadi, Belgian	MSY P HOU P BRO P LAX P MIA P IDL P LAX P HOU P BRO P LAX P IDL L VIDL A I VML A I VML A B C MIA B C	72 74 74 74 87 14 60 66 68 48 48 48 68 61 7 7 1 2 7 1 1 2 7 1 1 2 7 1 1 1 2 7 7 1 7 1	54 56 56 56 56 09 30 34 36 36 47 38 30 30 30 30 30 30 30 30 30 30	15 15 15 20 07 15 15 15 15 15 15 15 15 22 15 25 25 25	T M M M Su Dily Dily Dily Dily Dily except W Dily Except W Dily Su T.Th.Sa T.Th.Sa M M.Th Dily Except M Dily Sa W.Sa W.Sa W.Sa Su,T	Minatitlan, Mexico. Moanda, Bel. Congo Mogadishu, It. Somaliland Monbass, Kenya Montego Bay, Jamaica	CHI TW PHL TW MKC TW LAX TW LAX TW LAX TOL BO LOL BO LOL BO LOL WMIA P MSY P BRO P HOU P LAX P	1 39 1 34 1 45 1 60 1 06 1 33 1 33 1 29 38 31 21 24 2 22 2 09 2 09 2 00 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0	29 1.67 1.57 1.57 1.57 1.5 21 1.5 23 23	25 25 25 25 25 25 25 25 25 25 25 25 25 2	T.W.F.Su T.W.F.Su T.W.F.Su M.T.Th.Su M.T.Th.Su Dly Ex. M.T T.Su M.Th.Su M.Th.Su Dly Dly Dly Dly Dly Dly Su,Th Dly	Napies, Italy	BOS BO IDL EL IDL AE BOS AF CMI AF IDL, 8 IDL, 8 IDL SR IDL LI BOS LI IDL S MIA P YML T* YML T* YML T* HOU P BRO P LAX P IDL LAX	2 07 2 09 2 09 2 07 2 18 2 08 2 09 2 09 2 09 1 42 1 40 1 42 2 33 2 32	1 55 1 87 1 87 1 62 1 54 1 57 1 57 1 07 1 07 1 07 0 5 1 8 1 4 0 8 1 4 0 8 1 4 1 52 1 48 1 62 1 88 1 80	25 25 25 25 25 25 25 25 25 25 25 06 06 07 20 20 20 20 20	W. F. Sa Su, T. F. F. T. F. T. F. T. F. T. Sa W. Sa W. Sa W. Sa Th W. Joly except 8 T. Sa 3 Dly M M Dly Dly Dly T.
Congo Mauritius Mayagues, P. R. Mayagues, P. R. Mayagues, Cuba Mazatlan, Mexico Medan, Sumatra Medellin, Colombia Medellin, Colombia	IDL AI BOS AI CHI AI YML AI IDL BI MIA P BRO P HOU P HAX P MIA P HOU P HOU P LAX P MIA P HOU P LAX P MIA P M	F 2 9 9 F 2 8 F 2	1 2 18 9 2 17 7 2 24 7 7 2 18 1 2 18 1 3 18 2 18 2 22 2 20 2 20 3 20 6 20 9 2 24 9 2 24 2 20 9 2 24 1 30 1 30	25 25 25 25 26 26 26 27 27 27 27 27 27 27 27 27 27 27 27 27	M.T.Sa Sa W.Sa W.Sa W.Sa Uly Dly Dly Dly Dly Dly M.Th.Sa Dly Dly W.Sa Th.Sa Dly W.F.Sa Dly M.F.Sa Dly T.Th.Sa So, W.F.Sa So, W.Sa T.Th	Monteria, Colombisa	MIA P BRO P HOU P	322 303 383 383 383 383 383 383 383 383 383	251 253 273 273 275 275 275 275 275 275 275 275 275 275	15 15 15 15 15 15 15 15 15 15 15 15 15 1	Diy	N'Dola, N. Rhodeni Niamey, Fr. W. Afr Nice, France Niconia, Cyprus Nogales, Son., Mex Nome, Alaska Norrhoping, Sweden	IDL BO IDL BO IDL AF BOS AF CHI AF YML AF IDL S IDL AF IDL S IDL AF IDL P BOS P IDL BO IDL K IDL S IDL BO IDL S IDL BO IDL S I	1 27 1 23 1 23 1 66 1 66	72 1 87 1 57 1 57 1 34 1 32 1 39 1 31 98 98 98 98 98 98 98 98 98 98 98 98 98	25 25 25 25 25 25 25 25 25 25 26 26 20 20 20 20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	M.W.F. Th Dly M.F. F. M.Th.Sa Diy Sa M.F. M.F. M.F. M.F. M.F. M.F. M.F. M.F
Mexicali, Mexico Mexico City. Mexico	MSY P HOU P BRO P LAX P LAX P MIA P MSY P	3 3 3 0 3	3 .21 0 .22 2 .21 6 .01 4 .2	5 .15 3 .15 8 .15 5 .15 4 .07	Dly except Su Dly Dly	Montevideo, Uruguay	LGA AF BUF AF CLE AF IDL P MIA P MSY P HOU P	27 22 23 1 5 1 4 1 5 1 5 1 5	3 19 1 1.13 3 1 08 0 1.13 3 1.15	15 15 20 20 20 20 20 20	Su.T.Th	Canada Noumea, New Caledonia " Nueva Gerona (Isle	IDL AF BOS AF CHI AF YML AF	3 64 3 62 3 76 3 66	2 72 2 72 2 76 2 76	25 2 25 3 25 3 25 3 25 3 28	F Sa W,Sa W,Sa Dly
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Panahyba, Brasil Paramaribo, Berinamaribo, Barmanana Paramaribo, Berinamaribo, Berina	CHIL AF YML AF IDL BO I	1 26 1 24 1 2 2 1 2 2 2 50 0 2 50 0 1 2 5 5 1 2 5 5 1 2 5 6 1 2 5 5 1 2 5 6 1	1 02 0 1 0 1 0 1 1 0 1 0 1 1 0 1 0 1 1 0 1 0 1 1 0 1 0 1 1 0 1	25 25 25 20 07 07 20 20 20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	Dly W F T T T T T T T T T T T T T T Sa W,8u Dly except W W,8u Dly except W W,8a W,8a W,8a W,8a Dly 17 Wkly 18 N, T, Th Dly Sa, T, Th Dly Sa, T, Th Dly Dly Sa, T, Th Sa W, Sa, T, Th Dly M, T, Sa	Port Elizabeth, So. Africa Port Harcourt (Nigeria) Port of Spain, Trinidad Port of Spain, Ang. Eg. Sedan Port Alegre, Brazil Prague, Cischoslovakin Prestor, Cuba, Prestwick, Scotland Puerto Cortes, Honduras, Pierto Saures, Bol. Review, Scotland Rangoon, Burma. Resife (Pernambuce Brazil Regino, Rask, Canada Reunion Inland Rio de Janiero, Brazil Rio de Janiero, Brazil	YML T** IDL BO MIA BO BOS BO IDL, P BOS BO IDL SS IDL	2 500 2 644 2 744 2 500	1.72 1.44 2.44 2.34 2.37 2.73 2.74 8.83 2.84 2.99 2.44 2.10 2.14 2.14 2.10 2.16 2.16 2.16 2.16 2.16 2.16 2.16 2.16	255 15 15 15 15 15 15 15 15 15 15 15 15 15 1	Dly M,T,F Sa W,Sa W,Sa F F T,Sa Dly except M T,Th,Sa M,F Su,T,Th T,Th M,W,F Th,Sa W,Sa W,Sa	Robore, Bolivia Roenne, Denmark., Rome, Italy Roene, Italy Rolling, In. St. John, N. B. St. Johns, Antigus, B.W.I. St. Johns, Antigus, B.W.I. St. Johns, Antigus, B.W.I. St. Kitts, B.W.I. St. Lucia, Windward In. St. Thomas, Virgin In. (U.S.) Salisbury, So. Rhod Salta, Argentina San Ignacia de Velasco, Bolivia San Jose, Bolivia San Salvador, El Salvador El Salvador Santa Clara, Cuba, Santa Maria, Asoro	MIA P MSY P HOU P IDL K IDL S IDL S IDL S IDL S MIA P HOU P HOU P LAX P HOU P HOU P LAX P MSY P MSY P MSY P MSY P MSY P MSY P MIA P MSY P MSY P MIA P LAX P MSY P MIA R IDL R MIA P MSY TA MIA T MIA P MSY P MSY TA MIA P MSY TA MEX TA PIE AS MIA TN MIA P MSY TA MIA P MSY P MSY TA MIA P MSY TA MIA P MSY	366 37 40 266 37 40 266 37 40 266 37 40 266 37 40 266 37 40 266 37 40 266 37 40 266 37 40 266 37 40 266 37 40 266 37 40 266 37 41 38 38 38 38 38 38 38 38 38 38 38 38 38	92 23 34 34 46 46 46 46 46 46 46 46 46 46 46 46 46	25 25 25 25 25 25 25 25 25 25	M,Th,F Su,Th,Sa Su,T,Th,Sa Su,T,F Sa,M,W,F M,Th,Sa Su,M,W,Th Dly M,Th,Sa Su,W,W,Th Su,W

			RATES no Note)			(See Note)						RATES (See Note)					
Destination	Airport and Airline	Per Lb. (Under 100 Lbs.)	Por Lb. (Over 100 Lbs.)	Per \$100 Value	Depart	Destination	Airport and Airline	Per Lb. (Un- der 100 Lbs.)	Per Lb. (Over 100 Lhs.)	Per \$100 Value	Depart	Destination	Airpert and Airline	Per Lls. (Under 100 Lbs.)	Per Lh. (Over 100 Lhs.)	Por \$100 Value	Depart	
Sao Luiz, Brazil Sao Paulo, Brazil Shannon, Eire Shannon, Eire Stanleyville, Bel. Congo Stavenger, Norway. Stockholm, Sweden Strasbourg, France Stuttgart, Germany	MIA P MSY P MSY P MIA P MIA P MSY P HOU P BRO P LAX P IDL P MIA P MIA BZ IDL P HOU P BRO B RO P LAX P HOU B	1 31 1 41 1 41 1 1 1 1 1 1 1 1 1 1 1 1 1	2.13 2.10 .42 .33 1.57 .94 .95 .92 .95 .95 .95 .95 .95 .95 .95	.20 .20 .20 .20 .20 .25 .25	Dly ex. M,Th Dly ex. M,Th Dly ex. M,Th Sa,Th,Sa T,Th,Sa T,Th,Sa T,Th,Sa M,W,F Sa,T,Th M,W,F T,Th W M,W,F Th,Sa Uly Dly W,Sa Su,T,Th Dly W,Sa Su,T,Th,Sa Dly W,Sa Su,T,Th,Sa Dly	Suva, Fiji Islands Sydney, Australia Sydney, N. S Taipeh, Formona Takoradi (Gold Coast) Talara, Peru Madagascar Tampico, Mexico Tannarive, Madagascar Tanganyika Tanganyika Tangarier, Morocco Tegucigalpa, Hon Teberan, Iran Teberan, Iran	BRO P LAX P IDL AF BOS AF CHI AF YML AF IDL BO IDL AF BOS AF CHI AF YML AF HOU P BRO P LAX P MSY P BRO P LAX P MSY TA MEX TA	2.70 (2.68 kg) (2.68 kg) (2.68 kg) (2.68 kg) (2.68 kg) (2.50 kg) (1.88 1.38 5.59 6.62 6.02 6.02 6.02 6.02 6.03 6.03 6.03 6.03 6.03 6.03 6.03 6.03	200 200 200 200 200 200 200 200 200 200	Su, Th Su Sa M, Th Sa T, Th, Sa Su, M, T, F Su W, Sa W, Sa W, Sa W, Sa Dly W, F, M F Sa, Su, T, Th Dly W, F, M F Sa, Su, T, Th Dly Sa, Su, T, Th Dly Sa, Su, T, Th Dly Su, Su, T, Th Dly Sa, Su, T, Th Dly Su, Su, T, Th Su, S	Tela, Honduras Totago, B.W.I Totago, B.W.I Tokyo, Japan Toronto, Ont., Can Torreon, Coah, Mex Trapani, Italy Trinidad, Cuba, Tripoli, Libya Trujillo, Honduras Tahikapa, Bel. Congo Tunis, Tunisia, Tuxtia, Gutierres, Mexico Usumbura, Ruanda-Urundi Vancouver, B. C., Canada	YML BO IDL BO IDL TW CHI TW LAX TAF BOSS AFF YML AFF IDL SS MEX TA IDL SS FO P SEA P IDL AFF IDL SS FO D IDL TW IDL SS FO D IDL SS FO D IDL AFF IDL SS FO D IDL TW IDL SS FO D IDL S	1 68 1 74 1 1 75 1 1 74 1 1 75 1 1 75 1 75 2 02 2 50 0 2 50 0 3 65 3 3 64 3 3 711 3 65 2 50 0 2 70 70 70 70 70 70 70 70 70 70 70 70 70	.37 .22 1 60 1 02 1 14 1 01 1 07 99 1 02 1 04 1 01 1 07 1 13 1 27 1 02 1 3 09 22 20 01 87	100 100 100 100 100 100 100 100 100 100	Dly Th.Sa M.F	

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Deathnation		(8	(See Note)					RATES (See Note)							RATES (See Note)			
	Airport and Airline	Per U.A. (Un-	Parity (Over	Per \$100 Value	Depart	Destination	Airport and Airline	Per Lb. (Un- der 100 Lbs.)	Per Lh. (Over 100 Lbs.)	Per \$190 Value	Depart	Destination	Air ort and Airline		Por Lb. (Un- der 100 Lbs.)	Per Lb. (Over 100 Lbs.)	Per \$109 Value	
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MODULAR CONTAINER

(Continued from Page 16)

easily. The vertical flange on the top of all but the smallest unit is interrupted every 21 inches so as not to interfere with the continuous flanged recess on the underside.

Covers are secured by a special spring latch at the edge of the cover, one every 21 inches. Latch is part of the cover and cannot be mislaid. Flush handles permit individual containers to easily be manually shifted or carried.

Each of the Air Force's containers has a secondary use, in addition to transporting and protecting its contents. Containers are readily converted into usable items of equipment, such as: storage units, filing cabinets, bins, stockrooms, field desks, etc.

To accomplish this, Becker & Becker created collapsible partitioning that is self-supporting and quickly assembled and fitted into the modular containers. Collapsed, these partitions occupy a minimum space within the container to allow full use of cubage for packing. Assembled, partitions provide a wide variety of compartmentation to accommodate items of varying sizes and shapes.

Partitions are fabricated of a material known as Tekwood. This material, a three-ply laminate with a hardwood core, provides strength with minimum thickness and weight.

There are many decided advantages of the Airborne Modular Container System for Air Force use. Many of these advantages are peculiar to military use, some have commercial applications.

- ▶ The consolidated unit loads eliminate multiple individual handling operations usually associated with the number of containers that comprise the load.
- ▶ Extremely high strength per weight ratio of container's material and construction make them particularly suitable for airborne movement.
- ▶ Unit loads more fully utilize cargo space. Tiedown is easier.
- Less paper work since only one manifest is required for the individual unit load of as many as 20 individual boxes.
- ▶ Warehousing operations are more efficient.
- Convertibility of containers into usable items of equipment eliminates need by Air Force to ship such items separately in separate boxes. Thus, another reduction in amount of mate-

riel handled and increased available cargo space.

Compartmentizing within the containers permits orderly storage.

"From a tactical point of view, the new Airborne Modular Container System promises swifter deployment, greater mobility and better field equipment for the Air Force," according to Nathaniel Becker, partner in the industrial packaging design firm. "Readiness time in battle can be cut from days to hours and air wing supply and storage, air transportability of equipment and packing simplified. From a commercial point of view, this concept of materials handling suggests solutions to the problem of increasing efficiency in commercial air transport."

Becker points out that air cargo carriers, for example, may find it advisable to supply their customers with similar modular containers to simplify pickup, consolidation, breakdown, and delivery. Or, that after certain changes in construction, they could be used as one-way containers by certain types of shippers. Such commercial use, or the other commercial possibilities, he said, require developmental programs similar to the Air Force's in order to determine the peculiar needs of the parrier as well as consignees.

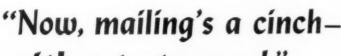
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